Summary of Proposed Residential Measures

2005 Energy Efficiency Standards

November 5, 2002

ELEY associates

Time Dependent Valuation

  - Proponent: PG&E
  - Workshop: April 2
  - Standard: Both
- TDV energy replaces source energy throughout the standard and the ACM manuals.

Gas Cooling

  - Proponent: SoCalGas
  - Workshop: August 27
  - Standard: Both Modeling

- New mandatory requirements for gas-engine heat pumps and AC units (§112).
- New modeling rules for gas-engine heat pumps and AC units are added to the ACM.

Photovoltaics

  - Proponent: None
  - Workshop: Not scheduled
  - Standard: Both

- Nothing is implemented in the November 5, 2002 draft.
- The CEC has determined that no credits will be offered for PVs.
- A pre-wiring requirement is being considered as a mandatory measure.

Demand Responsive Controls

  - Proponent: None
  - Workshop: Not scheduled
  - Standard: Both
- Still being considered.

Residential Construction Quality for Walls

- Proponent: CEC
- Workshop: April 23
- Standard: Res Env

- A compliance credit is offered for special inspection by a HERS rater to verify correct installation of wall insulation. This is implemented in ACM 3.3.2 and ACM 4.2.2.
- An overall U-factor multiplier is applied within the ACM. Form 3 calculations remain unchanged.
- The inspection protocol is documented in ACM RQ-2005.

Residential Construction Quality for Attics

- Proponent: CEC
- Workshop: July 18
- Standard: Res HVAC

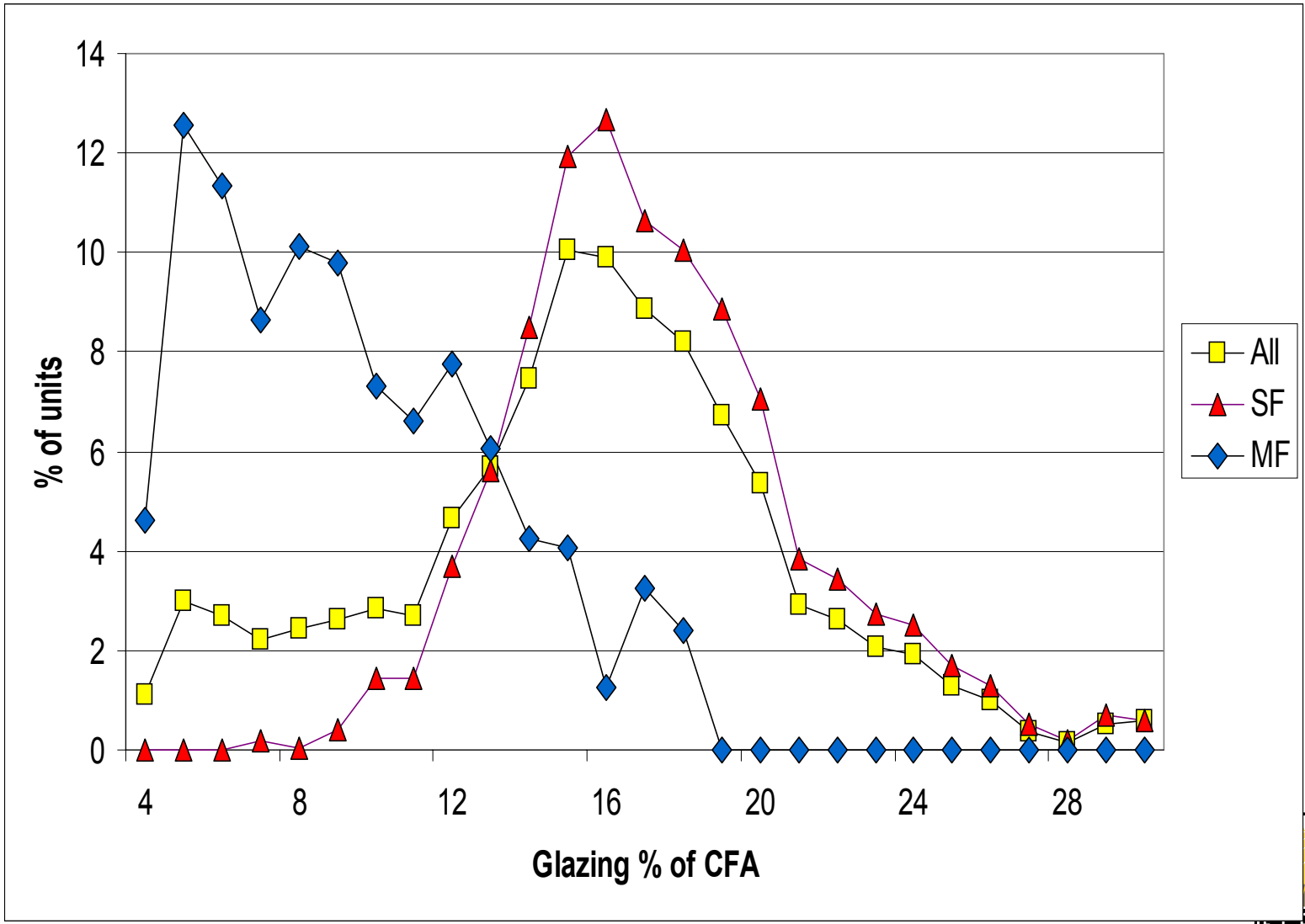
- A compliance credit is offered for special inspection by a HERS rater to verify correct installation of wall insulation. This is implemented in ACM 3.3.2 and ACM 4.2.2.
- An overall U-factor multiplier is applied within the ACM. Form 3 calculations remain unchanged.
- The inspection protocol is documented in ACM RQ-2005.
- See errata.

Residential Fenestration

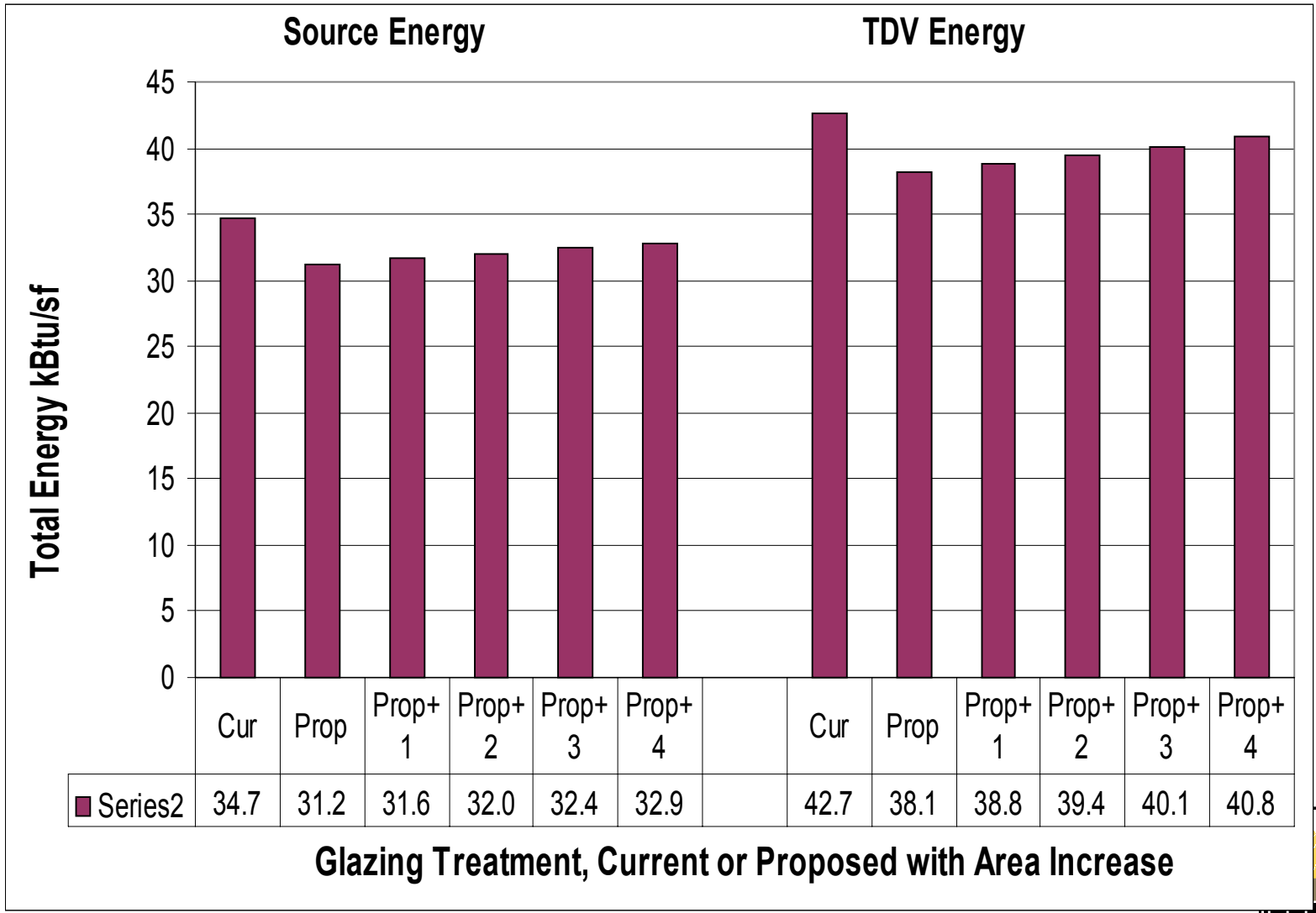
  - Proponent: CEC
  - Workshop: May 30
  - Standard: Res Env

- Residential area for the standard design is set equal to the proposed design unless it exceeds 20% of the conditioned floor area.
- Glazing U-factor criteria will be adjusted resulting from changes to NFRC rating procedures.

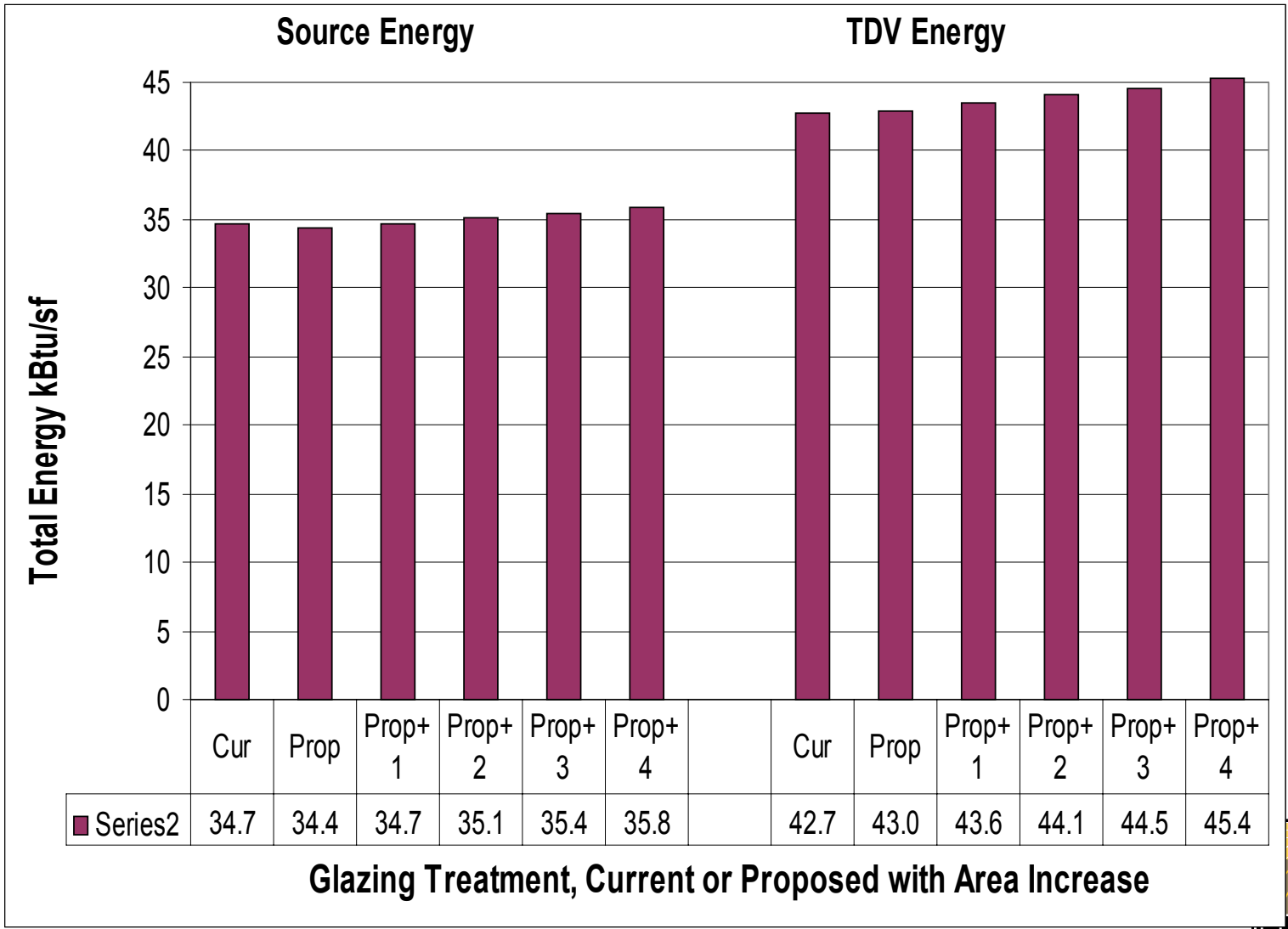
Distribution of Glazing Area



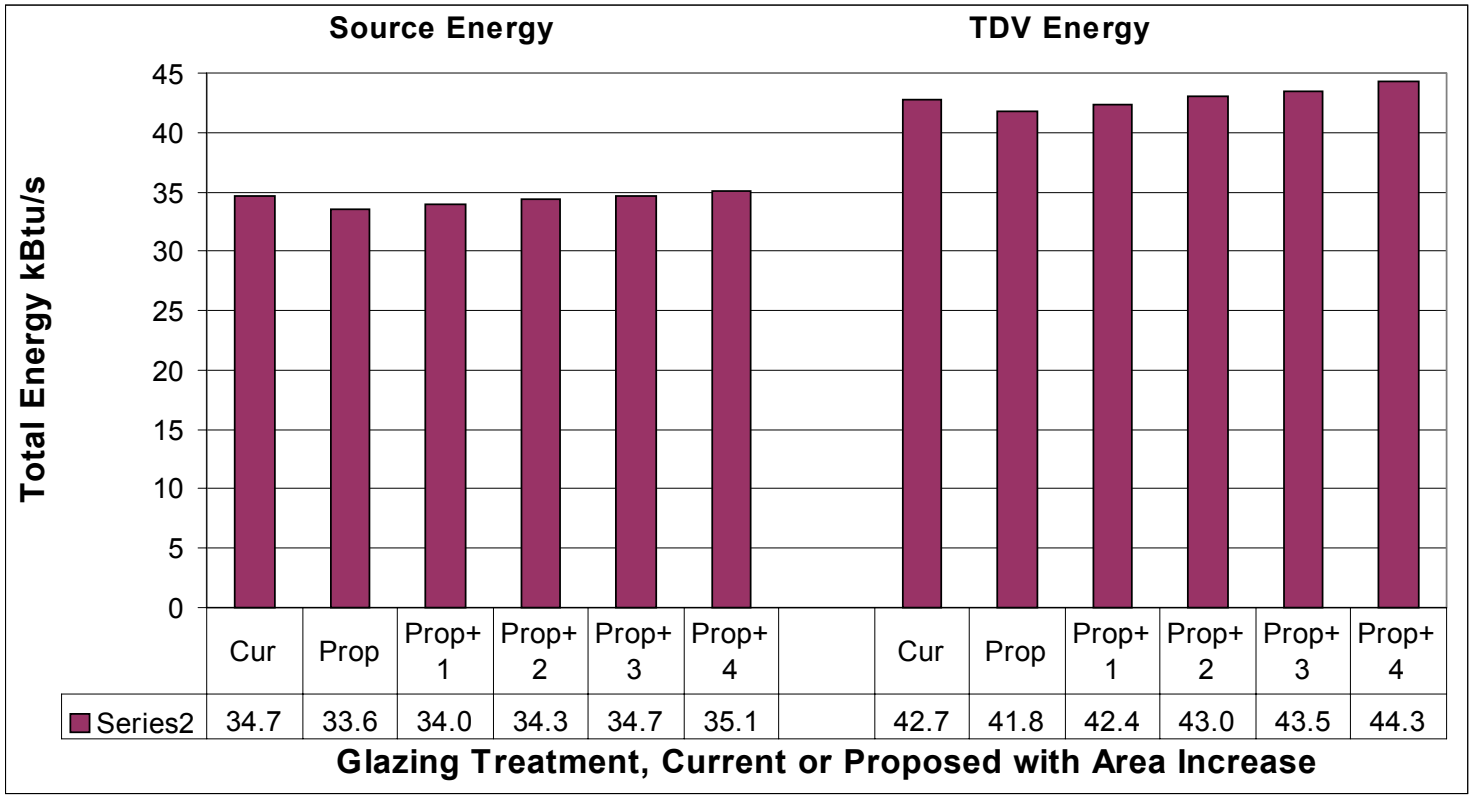
Multi-Family Impact



Single Family Impact



Overall Impact



Improvements for Existing Homes (Windows)

- Proponent: PG&E
- Workshop: April 23
- Standard: Res Env

- The prescriptive fenestration performance requirements apply for window replacements in existing buildings.
- These are implemented in §152(a) and §152(b)

Group 4 Measures from November Workshops

- Variety
- Workshop: Group 4
- Standard: Res Env

- Fenestration exception for less than 500 ft² is removed.
- List of radiant barrier suppliers will be provided in the residential conservation manual.
- U-factor calculation procedures may be modified to be consistent with ASHRAE/IESNA Standard 90.1 Appendix A.

Maximum Allowable Cooling Capacity

  - Proponent: CEC
  - Workshop: July 18
  - Standard: Res HVAC

- ACMs are required to calculate maximum allowable cooling equipment size (compressors).
- The maximum compressor size can be for the worst orientation for production homes and allows for available system sizes.
- The sizing procedure is documented in ACM RM-2005 and in the §151(h) of the Standard.
- Flexibility is offered when equipment is used that is more efficient at peak conditions

Residential Ducts

  - Proponent: CEC
  - Workshop: July 18
  - Standard: Res HVAC

- Standard requires R-8 ducts instead of R-4. in all but climates 6, 7, and 8.
- The modeling procedure for fans is modified and a credit is added for high efficiency fan and duct systems.
- Porous lined flex duct is prohibited.
- The modeling procedure for fans is added to ACM RF-2005 and ACM §3.2.13.

Improvements for Existing Homes (Ducts)

- Proponent: PG&E
- Workshop: May 30
- Standard: Res HVAC

- Not implemented in the November 5, 2002 draft.
- The measure is still under consideration and may be included in a later draft.

Residential Computer Modeling

  - Proponent: CEC
  - Workshop: April 2
  - Standard: Res Modeling
- Implemented in various sections of the Residential ACM manual.
- Changes include thermostat setpoints, slab edge loss model, natural ventilation assumptions, and solar gain factor adjustment.

HVAC Duct and Attic Hourly Models

  - Proponent: PG&E
  - Workshop: April 2
  - Standard: Res Modeling

- ACM RF-2005 is updated to implement the hourly duct modeling procedure.
- A seasonal duct efficiency is still used for ducts in locations other than attics.

Night Ventilation

- Proponent: PG&E
- Workshop: Not scheduled
- Standard: Res Modeling

- This proposed compliance option is still under development and may be implemented in the residential ACM manual.

Residential Measures
California Energy Efficiency Standards 2005

Comparison of Measures

Delta % TDV Compared to Proposed Package
Negative is TDV energy savings

	CTZ															
Compliance options	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
NonMtl LSLE Glass	3	-9	-11	-12	-13	-13	-12	-9	-9	-7	-8	-9	-7	-8	-6	-11
NonMtl HSLE Glass	-8	2	-12	-2	-13	-9	-2	13	15	14	7	7	8	5	11	-8
NonMtl Clear Glass	-2	9	-6	5	-7	-4	5	20	23	22	14	15	15	12	17	-1
Seer 14/EER12	0	-3	-2	-2	-2	-2	-2	-5	-6	-8	-7	-5	-9	-8	-14	-3
High Cons Quality	-9	-7	-7	-7	-8	-5	-7	-6	-6	-6	-6	-6	-5	-5	-3	-7
High Eff Air Handler	0	-2	-1	-1	-1	-1	-1	-2	-3	-4	-3	-3	-4	-4	-6	-2
HouseWrap	-3	-2	-2	-2	-2	-1	-2	-1	-1	-1	-2	-2	-1	-2	-1	-3
Radiant Barrier	-1	3	-1	-2	-1	-1	-2	3	4	4	3	3	3	3	5	-2
TXV	0	1	-1	-1	-1	-1	-1	2	3	4	3	2	4	3	6	-1
Duct R4	3	3	2	3	2	1	3	1	2	2	3	3	3	4	4	4
Duct Sealing	7	7	6	6	6	3	6	4	5	7	9	7	8	10	13	10
Mtl Dbl Clr Glass	7	15		11			11	24	27	26	19	20	20	17	22	6

ELEY associates

Hourly Water Heating Calculations

- Proponent: PG&E
- Workshop: May 30
- Standard: Res hw

- The hourly water heating methodology is implemented in ACM RN-2005.
- The procedure works for low-rise residential buildings and for high-rise residential buildings.

Water Heating Distribution Loss Performance Improvement Options

- Proponent: CEC
- Workshop: April 23
- Standard: Res WH

- The credits for distribution losses are revised and implemented in ACM RN-2005.
- Basecase losses are a function of both floor area and number of stories.

Water Heating in Multi-family

  - Proponent: PG&E
  - Workshop: May 30
  - Standard: Res WH

- The rules for defining the standard water heating system for multi-family is defined in §151(b).
- If the proposed design has individual water heaters, then so does the standard design. Likewise, if the proposed design has a center water heater, so does the standard design.
- Improved procedures are added to model losses from recirculation systems.

ELEY associates